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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/536,820	03/27/2000	Fu Jie Huang	MCS-101-99	4653

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LYON & HARR, LLP
300 ESPLANADE DRIVE, SUITE 800
OXNARD, CA 93036

EXAMINER	
KIBLER, VIRGINIA M	

ART UNIT	PAPER NUMBER
2623	15

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/536,820	HUANG ET AL.	
	Examiner	Art Unit	
	Virginia M Kibler	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-10,15-20,25-29 and 31-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,6,9,10,15,16,19,20,25,26,29 and 31* is/are rejected.

7)☒ Claim(s) *7,8,17,18,27,28 and 32-34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 5, 10, 15, 20, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rowley et al. (*Rotation Invariant Neural Network-Based Face Detection*) in further view of Baluja et al. (6,128,397).

Regarding claim 1, Rowley et al. ("Rowley") discloses a face detection process including creating a database of a plurality of model image characterizations, each of which represents the face of a person as well as the person's face pose (Figure 3). Rowley discloses training a neural network ensemble to determine a face pose and detects if a face is present from a region which has been extracted from the input image and characterized in a manner similar to the plurality of model images (Abstract), wherein the network ensemble comprises (Figure 2), a first stage having a plurality of classifiers each of which has input and output units and is dedicated to a particular pose range and outputs a measure of the similarity indicative of the similarity between the characterized input image region and each of the model image characterizations associated with the particular pose range of the classifier (Sect. 2.1), and a fusing neural network as its second stage which combines the outputs of the classifiers to generate an output indicating whether a face is present and the face pose of that person, and employing the network ensemble

to determine if a face is present and the face pose (Sect. 2.2). Rowley discloses determining the face pose and detecting if a face is present. Rowley does not explicitly state identifying the face. However, Baluja et al. ("Baluja") teaches that it is known to determine the face pose, detect whether a face is present or not, and then to identify the person (Fig. 2; Col. 5, lines 58-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the face detection disclosed by Rowley to include face recognition as taught by Baluja because it is well known and routinely implemented in the art in order to recognize the identity of faces in an image.

Regarding claim 5, Rowley discloses extracting the portion of the model image depicting the face, normalizing the extracted portion of the model image by resizing it to a prescribed scale if not already at the prescribed scale and adjusting the region so that the eye locations of the depicted subject fall within a prescribed area (Sect. 2.1, para. 3-4), and cropping the extracted portion of the model image by eliminating unneeded portions of the image not specifically depicting part of the face of the subject to create a model face image (Figure 3).

Regarding claims 10 and 20, the arguments analogous to those presented above for claims 1 and 5 are applicable to claims 10 and 20. Rowley discloses determining the face pose for each of the face regions extracted from the model images and categorizing each face region by assigning each to one of a set of pose ranges into which its associated face pose falls (Figure 3). While Rowley does not appear to explicitly mention a computer program comprising program modules executable by the computing device comprising all of the recited elements, this would have been clearly obvious in light of Rowley's disclosure.

Regarding claims 15 and 25, the arguments analogous to those presented above for claim 5 are applicable to claims 15 and 25.

3. Claims 6, 9, 16, 19, 26, 29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rowley et al. (*Rotation Invariant Neural Network-Based Face Detection*) and Baluja et al. (6,128,397) as applied to claims 1, 10, and 20 above, and further in view of Turk et al. (5,164,992).

Regarding claim 6, Rowley discloses categorizing the model face images by assigning each to one of a set of pose ranges into which its associated face pose falls (Figure 3). Rowley discloses choosing a prescribed number of model face images which have been assigned to the selected pose range (Figure 3; Sect. 2.1, para. 3). Rowley and Baluja do not appear to discloses using PCA. However, Turk et al. ("Turk") teaches that it is known to concatenate each of the chosen model face images to create a respective dimensional column vector for each (Col. 3, lines 49-65), compute a covariance matrix from the DCVs (Col. 4, lines 1-7), calculate eigenvectors and the corresponding eigenvalues from the covariance matrix (Col. 4, lines 3-7), rank the eigenvalues in descending order and identify a prescribed number of the top eigenvalues (Col. 4, lines 30-37), use the eigenvectors corresponding to the identified eigenvalues to for the rows of a basis vector matrix (Col. 6, lines 57-60), and multiplying each DCV by each BVM to produce a set of PCA coefficient vectors for each model face image 104 (Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the face recognition disclosed by Rowley and Baluja to include the details mentioned above, as taught by Turk, because it is well known in the art for defining the variation among the face images (Col. 4, lines 3-7).

Regarding claims 9, 19, and 29, Rowley and Baluja do not appear to explicitly state characterizing an image to be an unknown person if it does not match to a prescribed degree. However, Turk teaches that it is known to designate the input image region to be an unknown person determined by a prescribed threshold based on the degree of similarity between the characterized input region and the most closely matching model image characterization does not exceed the prescribed threshold (Col. 5, lines 8-12). Turk further discloses the implementation of a neural network to identify an unknown person (Col. 10, lines 23-28) which would thereby entail training and employing the neural network. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the face recognition disclosed by Rowley and Baluja to include characterizing an image as an unknown as taught by Turk because it is a methodology routinely implemented in face recognition in order to classify an image not included in a database.

Regarding claims 16 and 26, the arguments analogous to those presented above for claim 6 are applicable to claims 16 and 26. Turk does not disclose repeating the actions for each pose. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the training disclosed by Turk to include repeating for each pose taught by Niyogi in order to provide training associated with each pose.

Regarding claim 31, the arguments analogous to those presented above for claims 5 and 6 are applicable to claim 31.

Allowable Subject Matter

4. Claims 7, 8, 17, 18, 27, 28, and 32-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments filed 4/12/04 have been fully considered but they are not persuasive.

Summary of Applicant's Argument: A face pose refers to a "particular pitch, roll and yaw angles that describe the position of a person's head" as stated in the specification on page 3, lines 28-29. Neither of the cited references teaches providing the face pose.

Examiner's Response: In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., pitch, roll, and yaw angles) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Other Prior Arts Cited

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Pat. No. 6,741,756 to Toyama et al. for estimating the orientation of an object; and

U.S. Pat. No. 5,459,636 to Gee et al. for position and orientation estimation neural network.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Virginia M Kibler whose telephone number is (703) 306-4072. The examiner can normally be reached on Mon-Thurs 8:00 - 5:30 and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Virginia Kibler
06/22/04

MEHRDAD DASTOURI
PRIMARY EXAMINER